

A WINDOW FRAME FOR A WINDOW-LIFT EQUIPPED MOTOR-VEHICLE DOOR.

Description

The invention relates to a window frame for a motor vehicle equipped with a window lift, in particular a bowden-cable window lift fitted with drive catches guided in guide tracks to adjust the window-pane height, the window frame being insertable into a hollow-door comprising a window lodging and being connectable to the hollow door and constituting a unilaterally open seat, guide or support for the window pane in the form of two cross-elements and one longitudinal element.

Such window frames are known and are preferred in new frame designs of motor vehicles or the like. The automotive manufacturer is faced with the problem of manufacturing the motor-vehicle door as a so-called hollow door and furthermore a window frame of the initially cited kind which can be connected to said hollow door. The window frame, already comprising the window seals, the window pane per se and if called for also the door seal and the adapter for the sideview mirror, is inserted in assembly from above into the window lodging of the hollow door and then will be connected for instance at the end face to the door box. The window lift is subsequently installed in the door box. When being installed, the frame must be aligned relative to the roof as well as to both sides. This constraint however changes the positions of the window-pane guides connected to or integrated into the window frame relative to the door box or the door hollow. In this case readjustment or new alignment of the window lift relative to the changed window frame position will be required.

Accordingly it is the objective of the present invention to so further develop a window-lift fitted window frame of the initially cited kind that simple assembly of the vehicle door inclusive the window lift shall be assured.

This problem is essentially resolved in the invention for a window frame evincing the initially cited features in that the guide tracks each are affixed to one free segment of the cross-elements insertable into the window lodging and in that the drive catches are connected to the window pane received in the window frame.

Integrating the window lift into the window frame offers the advantage that during window-frame assembly, that is during its alignment relative to the roof contour and the sides, any additionally required alignment of the guide tracks or further components of the window lift no longer are required because firm configuration of the guide tracks of the window lift and the window pane or the pane guides has been established. Moreover this window-frame design with integrated window lift offers the advantage that separate accessories to affix the window pane no longer are needed. Therefore the hitherto required accessory affixation of the pane no longer are needed. Another advantage also is in the degree of integration, whereby substantially fewer parts must be combined or installed at the manufacturer's assembly line compared to conventional devices or methods.

In a first advantageous embodiment of the invention, the free end zones of the guide tracks comprise bowden-cable reversing elements. Preferably the bowden cable is guided in an 8-loop around the reversing elements and is connected to the drive catches.

Advantageously the pane guide already has been integrated into the cross-elements and optionally into the longitudinal element.

Furthermore the shaped seals for the window pane are integrated in another embodiment of the invention into the window frame.

In another advantageous further development of the frame design of a window frame, the adapter for the sideview mirror is part of the window frame and in particular is integral with the window frame.

In another advantageous embodiment, an electric drive is linked to the cable-drum housing.

The invention furthermore concerns a method to instal a window frame defined by one of the above claims in a hollow door comprising a window lodging. The method is characterized in that the window frame is inserted into the window lodging and is connected to the hollow door for instance by screws and then an electric drive is coupled to the cable-drum housing and this drive is affixed to the hollow door and in particular to an inside sheetmetal of the hollow door.

Further objects, advantages and features and applications of the present invention are discussed in the following description of an illustrative embodiment and in relation to the drawings. All described and/or graphically shown features per se or in arbitrary, pertinent combination constitute the object of the present invention, even independently of their summaries in the claims or such claims' inter-relationship(s).

5 **Fig. 1** is a sideview of a schematic illustrative embodiment of the window frame of the invention fitted with a window lift, and

Fig. 2 shows the installation of the window frame in a hollow door.

For installation, the window frame 1 shown in the Figures is inserted from above into
10 the window lodging 15 of a hollow door 16 of a motor vehicle. The pane guide(s) 2 and where called for the seals for the window pane are resp. integrated at and into the window frame 1. An adapter 4 also is present at the window frame 1 and will firmly support the sideview mirror.

The window frame 1 consists of two cross-elements 13 and one longitudinal element
15 14 connecting the cross-elements to each other, in particular in integral manner, whence the window frame is configured as a unilaterally open seat, guide or support for the window pane 3.

The guide tracks 6 of the bowden-cable window lift 7 each are affixed to a free segment 5 of the cross-elements 13, where this segment 5 is insertable into the window lodging. The drive catches 10 adjusting the height of the window pane 3 are guided in the guide tracks 6 and are affixed to this pane 3 received in the window frame 1. Reversing elements 8 for the bowden cable 9 of the cable-driven window lift 7 are mounted at both upper and lower ends of the guide tracks 6. The bowden cable 9 is guided or looped in an 8-loop about the reversing elements 8, the drive catches 10 guided in the guide tracks 6 and driving the window pane 3 being affixed to the bowden cable 9. The window pane 3 can be raised and lowered by synchronously raising and lowering the bowden cable 9. The bowden cable 9 is guided in a cable drum housing 12, this drum being rotatable by means of an electric drive 11.
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The pane guide is integrated into the cross-elements 13 and optionally into the longitudinal element 14 of the window frame 1. The shaped seals for the window pane 3 also are integrated in the window frame 1.

For purposes of assembly, the window pane 1, together with the integrated cable window lift 7 including the cable drum housing 12 but excluding the electrical drive 11, is delivered to the automotive manufacturer's belt. The window frame 1 is then inserted by the free ends of the cross-elements 13, which also hold the guide track 16, into the window lodging 15 of the hollow door 16 and where called for are connected to this hollow door or to the end face of the door box 17. Thereupon the electric drive 11, which is linked to the cable drum housing 12, is inserted by its output shaft so as to pass through a corresponding aperture of the inside door sheetmetal. In this manner both the drive 11 and the cable drum housing 12 are fastened in place.

Besides the already cited advantages of the frame design of the invention with integrated window lift, another advantage is offered, namely that because of the steps of the invention the drive 11 is mounted inside the door sheetmetal and is protected from water spray.